REMARKS

The title of the invention has been amended to provide a new title, as required in the Office Action, that is indicative of the invention to which the claims are directed.

The claims of the application are rejected in the Office Action under 35 U.S.C. § 103(a) as being unpatentable over Fukui et al., WO 2002/21616 ("Fukui") in view of Hiroshi ISHIZUKA et al., JP 10-040958, machine translation (identified by the Office in the Action as "Hiroshi et al." and referred to herein as "Hiroshi").

The rejection of the claims under 35 U.S.C. § 103(a) over Fukui in view of Hiroshi is the same rejection that was made in the second Office Action dated January 7, 2009, and in the Final Office Action dated July 6, 2009.

In a response filed April 7, 2009, to the second Office Action and in a Submission under 37 C.F.R. § 1.114 filed October 6, 2009, in response to the Final Office Action, applicants argued that the combination of Fukui and Hiroshi is insufficient to support a case of prima facie obviousness of the claims of the application under 35 U.S.C. § 103(a).

Applicants explained that the negative electrode active materials used in the batteries of Fukui and Hiroshi are different. Fukui discloses a lithium secondary battery wherein the negative

electrode is formed by sintering a mixture of active material particles containing silicon and/or a silicon alloy.

Hiroshi, on the other hand, discloses a lithium secondary battery in which the negative electrode contains a non-crystal chalcogen compound and/or non-crystal oxide which can include silicon.

Applicants argued that, in view of these different negative electrode active materials, a person of ordinary skill in the art could not have reasonably predicted the results of adding dissolved carbon dioxide as in Hiroshi to the electrolyte of the different battery of Fukui and would not have been otherwise motivated to add dissolved carbon dioxide gas to the electrolyte solution of the rechargeable lithium battery of Fukui.

In the present Office Action, the Office has responded to the above argument by stating that there is sufficient motivation, based on the teachings of Hiroshi, to add dissolved carbon dioxide to the electrolyte of the battery of Fukui because the "references are both directed towards lithium secondary batteries using active materials containing silicon or silicon alloys using a nonaqueous electrolyte." (Action, page 8, lines 4-6).

The position of the Office is wrong. Hiroshi does not teach, explicitly or implicitly, that the effect of adding carbon dioxide

to the nonaqueous electrolyte of its battery will be exhibited by all lithium secondary batteries using active materials containing silicon or silicon alloys using a nonaqueous electrolyte. To the contrary, Hiroshi teaches that the effect of carbon dioxide contained in the nonaqueous electrolyte requires a specific material in the negative electrode. In the Abstract, Hiroshi describes the problem to be solved by its invention as obtaining a nonaqueous electrolyte secondary battery having superior charge and discharge characteristics by "containing a specific material in a negative pole and containing carbon dioxide in a nonaqueous electrolyte." (Emphasis applicants').

The specific material in the negative pole of Hiroshi is described as being made mainly of a non-crystal chalcogen compound and/or non-crystal oxide containing three or more atoms selected from 1, 2, 13, 14, and 15 groups of the periodic table (English Abstract, page 2, lines 5 - 7 of the machine translation attached to the Office Action). The negative electrode material disclosed in Hiroshi can be expressed by a general formula (1) $M^1M^2pM^4qM^6r$, wherein M^1 and M^2 are different from each other and at least one is selected from Si, Ge, Sn, Pb, P, B, Al, and Sb; M^4 is at least one selected from Li, Na, K, Rb, Cs, Mg, Ca, Sr, and Ba; M^6 is at least one selected from O, S, and Te; p and q are 0.01 - 10; and r is

1.00 - 50) (page 2, lines 13 - 18 of the machine translation attached to the Office Action).

Fukui, on the other hand, uses silicon powder (silicon and/or silicon alloy particles) as the active material of the negative electrode.

Silicon and/or silicon alloy particles are not the "specific material in a negative pole" required by Hiroshi to be combined with carbon dioxide in a nonaqueous electrolyte to obtain the superior charge and discharge characteristics described therein. Moreover, the Office has not provided any reasoning or evidence to show that silicon and/or silicon alloy particles would have been expected to function in the same or similar way as the non-crystal chalcogen compound and/or non-crystal oxide of Hiroshi. (The Office has the initial burden of supporting a case of prima facie obviousness of a claimed invention under 35 U.S.C. § 103(a)).

Moreover, it is noted that Hiroshi provides only one example in which $SnGe_{0.1}B_{0.5}P_{0.58}Mg_{0.1}K_{0.1}O_{3.35}$ is employed as a negative electrode material. Hiroshi does not provide any specific example using a "silicon-containing compound". Therefore, Hiroshi does not disclose the results of adding dissolved carbon dioxide to the electrolyte of a battery using a "silicon-containing compound".

For the above reasons, the combination of Fukui and Hiroshi

does not support a case of prima facie obviousness of the claims of the application under 35 U.S.C. § 103(a) and the rejection must fail.

Further, notwithstanding that the combination of Fukui and Hiroshi does not support a case of prima facie obviousness of the claims of the application under 35 U.S.C. § 103(a), the present invention provides unexpected results sufficient to rebut a case of prima facie obviousness. Specifically, the present invention suppresses an increase in porosity of the negative electrode active material particles during charge and discharge (paragraph [0007] of the present specification). Neither Fukui nor Hiroshi discloses or suggests that an increase in porosity of negative electrode active material particles comprised of silicon particles and/or silicon alloy particles can be suppressed during charge and discharge by the addition of dissolved carbon dioxide to the electrolyte solution of a rechargeable lithium battery.

For this additional reason, removal of the 35 U.S.C. § 103(a) rejection and a notice of allowability of the claims of the present application are in order and are respectfully solicited.

The foregoing is believed to be a complete and proper response to the Office Action dated December 23, 2009, and is believed to place this application in condition for allowance. If, however,

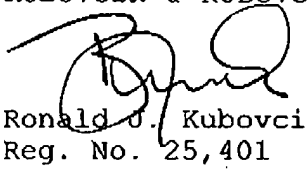
minor issues remain that can be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number indicated below.

In the event that this paper is not considered to be timely filed, applicants hereby petition for an appropriate extension of time. The fee for any such extension may be charged to Deposit Account No. 111833.

In the event any additional fees are required, please also charge Deposit Account No. 111833.

Respectfully submitted,

KUBOVCIK & KUBOVCIK



Ronald J. Kubovcik
Reg. No. 25,401

Crystal Gateway 3
Suite 1105
1215 South Clark Street
Arlington, VA 22202
Tel: (703) 412-9494
Fax: (703) 412-9345
RJK/ff